

The biology and a new subspecies of *Monticola sharpei*

by T. Farkas

Received 29th May, 1973

INTRODUCTION

The uncertainty about the generic and specific status of rock-thrushes in Madagascar has been discussed by Goodwin (1956). I worked in the field, in the breeding areas of these birds, from October 1969 to January 1970, as a result of which I was able to ascertain new details of various aspects of their biology. These details, preceded by an examination of specimens in the American Museum of Natural History, New York, support the suggestion of Salomonsen (1934), Goodwin (1956) and (recently) Hall & Moreau (1970) that the species concerned should be placed in the genus *Monticola*. Indeed this had been suggested much earlier by Milne-Edwards & Grandidier (1879: 367), using the name *Petrocincla* instead of *Monticola*. I (Farkas 1971) have already discussed *Monticola bensoni* Farkas, and I will do the same for *M. imerina* (Hartlaub) in due course. The subject of the present paper is the more complicated case of *M. sharpei* (Gray), which I studied in the field as follows:—Mt. d'Ambre, 3rd November/3rd December; Périnet, 9th–22nd December; Ankaratra Mts., 27th December/2nd January.

A NEW SUBSPECIES

There are several features indicating that there are three clear-cut subspecies. For clarification I now refer only to geographical distribution and to differences in colour-pattern in adult males. Firstly, in the *highland* race the slate-blue extends from the throat to the lower part of the breast, while in the *lowland* and *northern* (Mt. d'Ambre) races this colour does not extend below the throat. Secondly, the margins of the remiges and wing-coverts are rufous in the northern race; likewise in the lowland race, except that the primaries are grey-edged; while in the highland race there are no rufous margins except for the secondaries, which are pale rufous-edged. Thirdly, the bright rufous rectrices are only narrowly dark-tipped in the northern race, whereas in the other two these tips are broader, and the dark colour extends along the outer webs of the outermost pair. Furthermore, the northern race has a "super-rufous" phase in which the dark tips are reduced still more or even absent, and irregular red spots may even be apparent on the dark central pair of rectrices. Finally, in the lowland race some males have a very pale, almost whitish patch on the chin (Plate 1), strongly reminiscent of the patch occurring regularly in the male of *M. gularis* (Swinhoe) of eastern Asia.

Sharpe (1871, as *Cossypha imerina*) described an adult male collected by A. Crossley, hinting however that it might differ from the form described by Hartlaub (1860), now known as *M. imerina* (Hartlaub). Thereupon Gray (1871) designated a new species, which is now *M. sharpei* (Gray) (in the References below, note the misleading title of Gray's paper, since he described a new species of "*Cossypha*" as well as of *Caprimulgus*). There is nothing in Sharpe's description to indicate that the adult male which he had before him does not belong to the highland race, i.e. that it has grey-edged wing-coverts and primaries, and a slate-blue breast as well as throat. The specimen is in the British Museum (Natural History), and has been examined at my request by C. W. Benson, who confirms accordingly. It is the one listed by

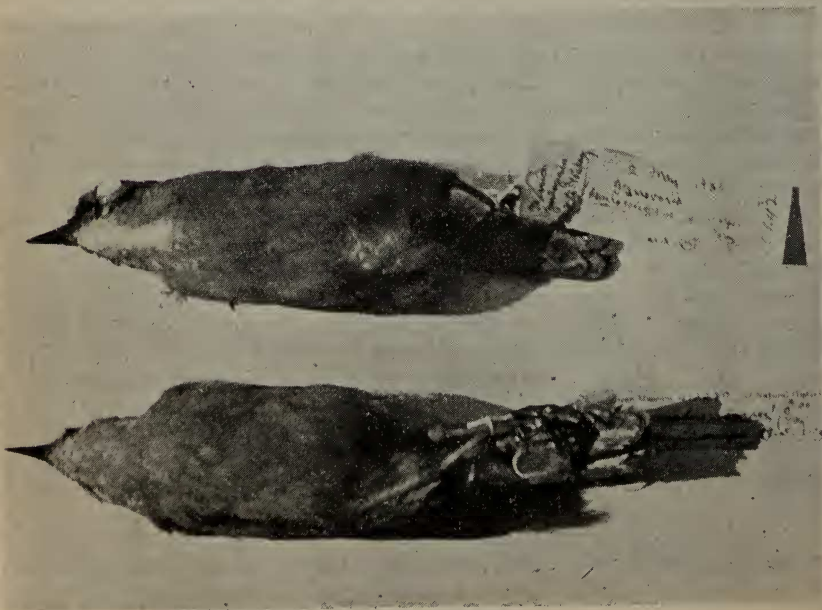


Plate 1. *Monticola sharpei salomonseni*, adult males; left, blue-chinned (normal), right, white-chinned (specimens in A.M.N.H.). By author.

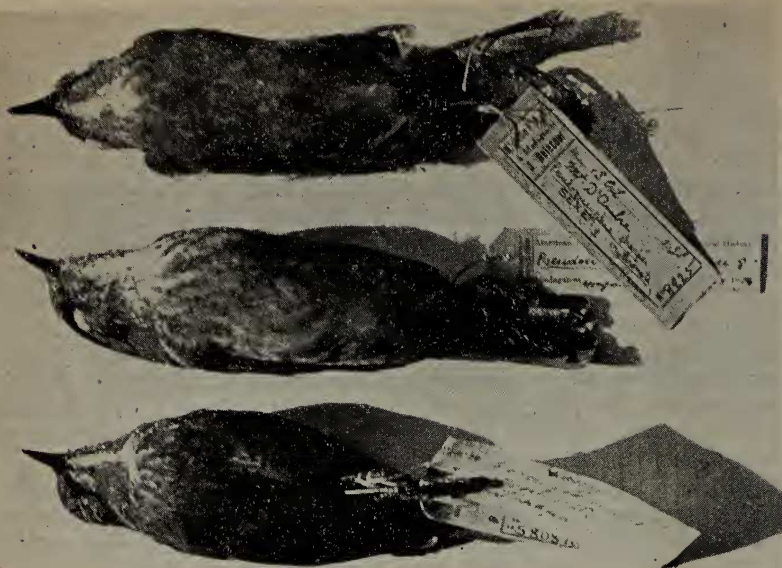


Plate 2. *Monticola sharpei*, adult females; left to right, *salomonseni*, nominate *sharpei*, *erythronotus* (specimens in A.M.N.H.). By author.

Warren & Harrison (1971) as a syntype of "*Cossypha sharpei* G. R. Gray, 1871" (*sic*), the other two syntypes doubtless being the two specimens regarded by Sharpe (1871) as young. The size of this specimen had already aroused the suspicion of Salomonsen (1934). He refers to it as "exceptionally big", with a wing-length of 82, as against 75-78 mm in "eight other males from Sianaka". Benson has also made its wing-length to be 82 mm. Thus this specimen belongs to the blue-breasted, grey-winged, large highland race, the correct name of which is therefore *Monticola sharpei sharpei* (Gray). Salomonsen (1934) overlooked this, and re-described the highland race as *M. imerina interioris*, which is accordingly a synonym of *M. s. sharpei*. Consequently the small lowland race is in need of a name and description:—

Monticola sharpei salomonseni, subsp. nov.

Type: ♂ adult, collected in May 1929, Sianaka forest, eastern Madagascar. In American Museum of Natural History, registered number 412287.

Measurements of type: Wing 71, tail 53, culmen (from rhamphotheca) 11, tarsus 24 mm.

Description: The adult male of *salomonseni* differs in colour from that of nominate *sharpei* in that the slate-blue of the throat does not extend onto the breast, and only the primaries have grey edges on their outer webs, the wing-coverts and secondaries being rufous-edged. *Salomonseni* is a very small form, indeed the smallest in the genus as a whole. For further detailed wing-measurements, see Salomonsen (1934, in which *sharpei* = *salomonseni*, *interioris* = *sharpei*). The tail seems disproportionately short; thus 47-59, av. 54.8 mm, in 12 males in the A.M.N.H.

By contrast, the adult female is little more than a small version of that of *M. s. erythronotus* (Lavauden), although with the strong rufous tints of this northern (Mt. d'Ambre) race relatively subdued. Yet the most distinctive feature is the white gular patch, reaching to the lower mandible, and edged by a dark malar stripe. This patch is less marked in the other two races (Plate 2). The underparts are pale brownish with a rufous tint, darkest on the breast and its sides, where there are oblong buff spots with dark, thin edges, diminishing downwards and replaced on the abdomen by narrow, dark apical tips to the feathers, giving a scaly appearance. The upperparts are plain dark olive with some red tinge, the wings similar but paler. The two central rectrices are dark olive with very fine, dark cross-bars, the others lighter with some rufous tinge, with a few irregularly shaped, pale rufous spots. Such spots and the rufous tinge are less developed in the nominate race, but more so in *erythronotus*, *salomonseni* thus being intermediate in this respect.

Distribution: *Salomonseni* occupies the eastern lowland primeval forests, down to sea-level around the Baie d'Antongil, and intergrades at higher altitudes with the nominate race. An adult male which I measured (wing 77, tail 57, culmen 13, tarsus 25 mm), in the museum of the Office de Recherche Scientifique et Technique Outre-Mer (O.R.S.T.O.M.), Tananarive, seems intermediate. It was collected in 1924 at Bejofo-Bealanana, ca. 14°30'S., 48°45'E. The nominate, highland race occupies the Ankaratra Mts., and high ground on the central ridge of Madagascar to the north and south. Georges Randrianasolo (pers. comm.) has recently collected it in the forest patches of the Ankazobe Mts. (north-west of Tananarive), and Benson in the Massif de l'Itremo, west of Ambositra (two females, one adult, wings 79, one juvenile, wings 80 mm, 10/11 January). Salomonsen (1934) suggests that the type-specimen of *sharpei* (that is, the syntype listed by Warren & Harrison

1971) came from somewhere in the Sianaka forest. In fact, as Benson corroborates, it is merely labelled "Madagascar". But it can be presumed that it was collected at a higher altitude west of the Sianaka forest, perhaps in the mountains west of Moromanga, or still further west and higher.

At present *erythronotus* is only known from Mt. d'Ambre, in the northernmost tip of Madagascar. But it may intergrade to the southward with the nominate race. According to Randrianasolo, during an O.R.S.T.O.M. expedition in November 1966 to the Massif du Tsaratanana, led by R. Albignac, an adult male of an unknown race of *M. sharpei* was collected at a nest with two well developed young. The site was at an altitude of 2,050 m, in light forest with many bamboos in the undergrowth, the nest being 1.5 m up on a moss-covered rock. This specimen is in the collection of Col. Ph. Milon, and still awaits determination. It could be an intermediate.

HABITAT PREFERENCE, GENERAL HABITS

In the Ankaratra Mts., from the lower edge of the primeval forests up to 2,000 m, near the summit, *M. sharpei* is common under the dense and high canopy wherever there is little or no undergrowth. The floor is thickly covered with fallen leaves and debris, in damper places with a cushion of moss. In clearings or less dense parts of the forests there is a high and lush shrubbery, unsuited to the species. In fact the birds prefer the more humid parts along streams, and wooded creeks. Along such creeks I found *sharpei* to be ubiquitous, although to-day most of them are cut off from the main body of the forests, encircled by pine plantations or low, dense secondary brush, both quite unsuited to it.

The female spends more time on the ground than does the male. There she is perfectly camouflaged both by her cryptic colour and her quietness (Rand 1936 aptly refers to *sharpei* as "sedate"). Often my first sight of the female was when she flew up only a few yards away, to alight on a low perch. If I tried to get nearer, she flew up into the canopy. The male is also often found on the forest floor, foraging among leaves and debris. Both sexes also take food regularly on mossy tree-trunks, lichen-bedecked thick branches, and even in the canopy. Their perches range from about 1 m up to the lower strata of the canopy. If frightened, they disappear into the canopy, remaining there, if necessary, silent and invisible for hours on end.

The race *erythronotus* prefers places where under a somewhat discontinuous canopy of medium to high trees a luxuriant undergrowth of shrubs, tree-ferns and *Pandanus* thrives. The damp floor is thickly carpeted with fallen leaves, debris, moss, ferns and grass. Many strong lianas intersperse the space under the canopy, giving variety to the typical habitat of the "hooly-hooly", as the local foresters call these birds, in the mist-forests of Mt. d'Ambre. Like the nominate race, *erythronotus* also seems attracted by streams and creeks, although one can find it just as often in the margins as in the depths of the forest. But it never occurs under a continuous and dense canopy lacking in undergrowth, and never takes to places where there are only young trees dispersed among a dense undergrowth. Subject to this, it occurs from the lower edge of the forest, altitude ca. 600 m, to almost the summit at 1,450 m, though mostly between 800 and 1,200 m. Assuredly this race prefers the undergrowth more than does nominate *sharpei*. I often saw males, especially at dusk, perched low by a forest path, to swoop down now and then for an insect on the ground, or even to chase prey on the wing with great skill. If alarmed, often with a peculiar and harsh shriek, they dived

with a quick loop into the undergrowth, attaining a safe distance and then ascending into the canopy. Although I could not approach a male nearer than some 15 m, sometimes I could get as near to a female as 4 m. The birds often flew up to a high perch on a main branch from the rear, the head just poking out, a careful watch being kept on my movements.

TERRITORY, REPRODUCTION

According to Rand (1936), the onset of breeding in most Madagascar birds is in some way adjusted to the seasonal rainfall. On Mt. d'Ambre, while there is ample humidity from mist throughout the year, there is also a definite rainy season from December to March, when there are between 100 and 300 mm of rain per month. In the central highlands the picture is similar, but in the east there is good rain in every month, except September/October, when the monthly average can be as low as 50 mm in some places. The races *erythronotus* and *sarpei* start breeding four to six weeks before the onset of the rains, that is, in the second half of October or early in November. In the east, at Périnet, I spent only the middle two weeks of December, mainly because I soon realised that breeding there was already over. A freshly moulted, subadult male in the A.M.N.H. (January 1923, Périnet) also supports the assumption that in *salomonseni* adults and young alike moult in December/January, whereas in the other two races this starts in March. Thus, assuming that six months are needed from time of hatching to completion of moult out of the spotted juvenile dress, it could be that *salomonseni* starts to breed in July, that is, about the driest time of the year. Possibly under the conditions of a more evenly distributed rainfall this would be advantageous.

There is no evidence of any movement in any race of *M. sarpei*. In the nominate and *erythronotus* territories are established in October. The largest one (in *erythronotus*) I estimated to be ca. 2.5 ha, but mostly they did not exceed 1 ha. Territorial rivalries seem to be confined to males; females, if present, were never involved in such activities. Indication of territory being marked by song, encroaching rivals were always received with threatening and self-asserting postures. A rudimentary display-flight served as a nuptial display (to the female) or as a kind of self-assertion (to another male). A male of *erythronotus*, incited by a tape play-back, performed in this manner repeatedly, in front of the tape-recorder. He first showed a self-asserting posture, and then flew off to another perch, where he made a gentle bow and repeated the self-asserting posture. The intervening flight had been straight, the wings slowly beaten, the tail fully spread and a bright nuptial song uttered. Similar, reduced display-flights have been reported for *M. cinclorhynchus*, vide Lister (1953), and for *M. gularis*, Neifeldt (1966).

In the few cases in which nest-building was observed, only the female was involved. Of the 18 nests found in the Ankaratra Mts., all were built on large trees, mostly in notches on trunks, but very occasionally in forks of thick branches, from 1.5 to 6 m above the ground. They were made entirely of vegetable matter, the thick base and walls mainly of moss, the cup neatly lined with fine rootlets. Typically in the highland race there is a light ring on the rim, caused by a layer of light-coloured rootlets, those towards the lining being darker (Plate 3). Average dimensions are:—height (including beard-like base) 16, total width of cup 8, depth of cup 5 cm. The nest of *erythronotus* is similar except for the absence of the light ring on the rim. The fibrous lining appeared to have been obtained from lianas. However, an important difference in site was noted. Five nests of *erythronotus* found were

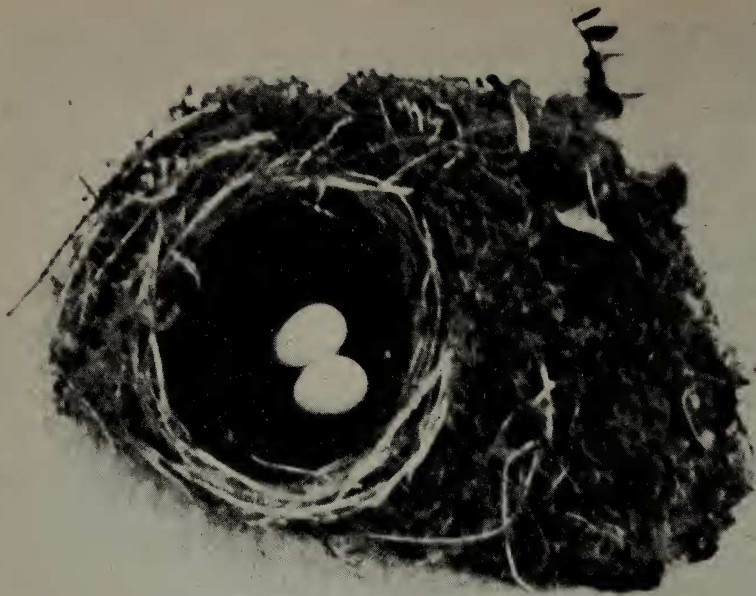


Plate 3. Nest with eggs of *Monticola s. sharpei*; Ankaratra Mts. By author.

all skilfully hidden among *Pandanus* leaves, 3 to 6 m up, always in the deep shadow of the forest canopy. A. Traka, chief forester at Les Rouselles Station, told me that *erythronotus* builds only exceptionally on tree-trunks, mostly on *Pandanus*. However, a sixth nest which I found on Mt. d'Ambre had been built on the trunk of a giant tree-fern, directly over a forest path.

In four clutches of *erythronotus* the clutch-size was only two, only in one was it three; the only clutch of the nominate was also two eggs. In both races the eggs are a pale unspotted turquoise. The two eggs from the Ankaratras measured 24×16.5 , 23×17 mm. Incubation was only observed in *erythronotus*. It was carried out solely by the female; although males, feeding incubating females, were observed at nests too. As soon as I approached a nest, the male always sang a few quiet warning melodies, whereupon the female slipped away from the nest. A female, two days before the hatching of eggs, somehow failed to do so; the male then stooped down to the nest with excited singing and chased her away. The period of incubation is not less than 15 days. Both parents feed the young, which after leaving the nest are under parental care for about one month. The nominate and northern races are probably single-brooded; in the lowland race the whole breeding pattern may be different, as already suggested.

POST-EMBRYONIC DEVELOPMENT

The observations in this and the following section are based mainly on two hand-reared young males of *erythronotus* which I kept from the age of 10 days for two years in captivity (ages as given are always from date of hatching), although supplemented by field observations. The skin of nestlings of *M. sharpei* is yellow, with long, pale grey down; bill pale grey, turning blackish

within two weeks; legs ivory, turning blackish after six weeks. The large head with a bright yellow gape, and long legs, are conspicuous. The sleeping habit of nestlings is also remarkable. They lie mostly on their sides with outstretched necks and legs, the latter "planted" against the lining of the cup of the nest. On the 11th day the eyes of my two young started to open, and by the 15th all my movements were attentively followed. On the 17th day they weighed respectively 32.5, 32 g; at 500 days 41, 43 g. The first clumsy attempts at preening started on the 12th day. They soon improved, and on the 17th preening was extended to the wings and tail. The first head-scratching (indirect) was observed on the 15th.

In begging, the head stretched towards the feeding parent turns alternately left and right from the axis of the body, following the movements of the parent's head. The body is lifted into a sloping position while supported on the intertarsal joints, and the wings are fluttered gently, the one nearest to the parent usually more vigorously than the opposite one ("asymmetrical") fluttering). "Symmetrical" fluttering also occurs, but vanishes soon after leaving the nest. The first vocal component is a quick succession of weak "peeping" tones, changing gradually after the 24th day into a humming "sreec", rather similar to the begging calls in other *Monticola* spp. This call, used in begging or for any other purpose, disappears when the young can feed independently.

The droppings are large, pear-shaped and enveloped in a tough, gelatinous substance. After leaving the nest they become smaller, and the gelatinous envelope disappears. My hand-reared young spent all their time either free in my room, or in a cage when I was on the move. But during a difficult stage of the expedition in January 1970, for reasons of their security, at night they were hung in linen bags over my bed. They accommodated themselves to this with such success that in the mornings they would only defaecate after I opened the bags. But the droppings were again as they had been in the nesting stage.

On the 19th day the young left the nest. They moved around on the ground with quick hops as do adults. (Young in general seem to spend the first few weeks mostly on the ground. Those which I encountered in the Ankaratras in December, when disturbed, quickly flew into the canopy, descending again to the floor when it seemed safe to do so.) On the 24th day the first attempt was made to pick up ants from the ground; by that time they were able to fly some distance with ease, and even make turns in mid-air. The first attempt to catch an insect in flight was made on the 30th day. By the 40th they were dismembering grasshoppers and earthworms, and within a few days had become self-supporting, although begging did not completely disappear until the fourth month.

On leaving the nest, the male can be identified by the vivid red tail, and the brighter lemon-yellow soles and orange gape (in the female the gape and soles are by contrast pale white, this contrast being a widespread feature in the genus as a whole, at all ages). By the 40th day, when the wings and tail had attained their full length, sexual dimorphism becomes further marked by the start of the growth of the axillaries, orange in the male, white tinged yellow in the female. Moulting of the juvenile dress started about the 120th day, on the underparts and nape, reaching its climax in the fifth month and ending early in the sixth. The subadult male has the full colour of the adult. The latter has apparently only one moult a year, and there is no marked

seasonal difference in plumage in *M. sharpei*. However, subadults can be distinguished from adults quite easily. This is because in the juvenile dress the greater wing-coverts have buffy apical markings and the secondaries pale buffy edges. These feathers, together with the primaries, axillaries and rectrices, are not changed in the post-juvenile moult.

I was obliged to cut-back the primaries of my hand-reared young of *M. sharpei* (and also those of young *Copsychus albospecularis pica* obtained at an early stage of the expedition), in order to prevent their escape. Also, owing to crowded cages and constant travelling, some tail-feathers were broken. After my return to my home in South Africa, I left these feathers alone, hoping that I could gradually remove them. But to my surprise, when the moult came, all the damaged primaries and rectrices were replaced in a natural way, while the undamaged ones were retained. A few other hand-reared *M. imerina* and *C. a. inexpectatus* which I collected at a later stage of the expedition, and which escaped cutting or damage, moulted normally; i.e., they retained all their remiges and rectrices. Thus it seems that functional inadequacy caused by damage as described above can induce premature moulting in the young.

DEVELOPMENT OF VOICE AND BEHAVIOUR PATTERNS

Adults of *M. sharpei* warn with a quiet "hjutt-tock-tock". Such notes can also be heard sometimes separately. The "hjutt" was first heard from the young on the 18th day, when they were frightened by a sudden movement on my part. The "tock" was first heard on the 21st day, and accompanied by a bow. A *distress*-call, the shriek already referred to, was also first heard on the 21st day. The *displeasure*-call, a staccato "kerrr-errr", was only first heard on the 117th day; on the same day the *social*-call was also first heard—a gentle "weed", repeated at longer intervals, serving as mutual contact between the sexes, and often heard during the field observations.

First attempts at *subsong* were made on the 17th day, while sleeping in the nest. The throats of the young pulsated, and a few weak inarticulate notes were heard. On the 20th day they sang while awake. Thereafter the daily amount of time spent in this exercise gradually increased, but even by the 40th day there had been no increase in volume. The rasping, guttural *double tones*, so typical of the *rehearsed songs* of all *Monticola* spp. (Greenewalt 1968), were first heard on the 59th day, increasing gradually so that about the 130th day they had become a general feature of the song of these two young. During the seventh month *subsong* was completely superseded by the *rehearsed song*, which in adults of the genus is the prevailing form of song in the off-season, though it can also be heard in the breeding season, restricted to the hottest time of day. This *rehearsed song* in *M. sharpei* is always of a very low volume, although rich in the aforementioned guttural notes and imitations. Development of *motif* or *primary song* also started at an early stage. On the 64th day one of the young burst into a few, very loud tones (a car had started near us); on the 90th day they repeatedly sang at dusk a few semi-loud motifs, and on the 120th day, again at dusk, they rendered a few short *melodies*. By the 280th day their *melodies* were in no way inferior to those of adult males; the volume of their *primary song* remained, however, generally low with a marked daily peak at dusk, until about the 350th day, when the volume of song increased considerably within a few days, heralding the onset of reproductive activity. There is a marked difference in the *primary songs* of at least *M. s. erythronotus* and *M. s. sharpei*, which, if this were

considered alone, could suffice to regard them as specifically distinct. The repertoire of *erythronotus* consists of a dozen or so highly stereotyped melodies while that of the nominate race is wider and characterized by a measure of variation between individuals. Singing at dusk is typical of both races, but I never heard singing at night.

As regards the *function* of *primary song* in *M. sharpei*, the above features distinguish the *territory song* of the races *erythronotus* and *sharpei*. Like so many other features, the song of *salomonseni* awaits investigation. The *signal song*, being only a shortened form of territory song, serves warning purposes in both races. The limited song-repertoire of females was only heard in this context; thus as soon as I approached a fledged young, it was mainly the female which uttered a few weak signal-motifs, coupled with the staccato note of displeasure and threatening postures.

The *courtship song* can be directed by the male either at a female or another encroaching male. In either case it is co-ordinated with courtship/self-asserting postures, and consists entirely of tonal material peculiar to the species but with an unmistakable similarity to the courtship songs of other *Monticola* spp. In the young it was first heard on the 196th day.

Both the nominate race and *erythronotus* can imitate. But, while *erythronotus* does only in the rehearsed song, *sharpei* imitates in both the rehearsed and territory songs. They imitate only the calls, never the songs, of other birds. The first imitation was heard on the 131st day. It was of the call of *Malacocoryphus zeylonus*, a common species around my home in the Cape. The repertoire was further enlarged on the 196th day by imitation of *Parus afer*; after the juvenile moult, calls of *Nectarinia famosa*, *Prinia maculosa* and *Spreo bicolor* were added. On the 220th day imitation was heard of *Hartlaubius auratus* and *Tchitra mutata*, and in the following weeks of *Coracopsis vasa* and *Nesillas typica*, which had last been heard some five months previously while still in Madagascar.

In addition to begging as described above, other *fixed action patterns* became apparent, in sequence as follows:—The *twitching* of the *folded wings* is only a gentle movement of the remiges including the primaries. It was first observed in sleeping nestlings only 16 days old. On leaving the nest, a slow *tilting* of the *folded tail* (up to ca. 30 degrees) was noted. While wing-twitching can be repeated several times in quick succession, tail-tilting is always a single movement. On the 91st day *twitching* of the *folded tail* was noted—a very quick spreading-and-folding of the rectrices. It is not very conspicuous because only the two outermost pairs of feathers are used in this scissor-like movement. It can be repeated, but only after a long interval. The *tail* can also be *completely spread* (fanned) and remain in this position for a while. Finally, the *fanned tail* can also be *twitched* by a very swift folding-and-spreading of the two outermost pairs of feathers only.

Two variations of head-movement were also noted in *M. sharpei*. On one, the head is pointed motionless towards the opponent, and the neck somewhat intract. In the other, the head is tossed rhythmically to the left—straight ahead—to the right, thence back to straight ahead. In both variations the head feathers are kept firmly depressed.

The sole *intention movement* is performed immediately on leaving the nest. The clumsily hopping young, attaining some elevated point, assumes an upright stance and makes a single, lazy bow synchronized with wing-twitching and tail-tilting. In great excitement only, this intention movement can be repeated twice or thrice in quick succession. The interesting

point is that this movement soon fades away with age; adults seldom so perform.

Interspecific aggressiveness was first noted on the 38th day, i.e. playful chasing of a fledged *Copsychus albospectularis*. On the 43rd day the first action of intraspecific aggressiveness followed. On the 59th with all feathers depressed and the body erect, the young showed the first *greeting ceremony*; the head pointed slightly upwards and the bill slightly open, a rapid subsong was uttered. From this juvenile posture the courtship display was gradually evolved.

On the 96th day the first *threatening posture* was noted; the feathers on the mantle, back and lower breast somewhat bristled, the head pointed stiffly towards the opponent, the wings and tail twitched synchronously at irregular intervals and a few warning calls uttered (this posture was observed in both sexes). Soon thereafter followed a stage of development when the young often showed ambivalent threatening and greeting postures while singing primitive courtship songs. From these elements first on the 280th day the *self-asserting posture* ("imponieren") and then on the 300th day the *courtship display* evolved. In the self-asserting posture all the feathers are depressed, and the tail widely spread and either tilted up (if the male stays on the floor), or pressed down (if on a branch). In either position the tail is also twitched repeatedly. The head is tossed rhythmically, and a few sharp whistles uttered (cf. *M. rupestris* and *M. angolensis*, in Farkas 1962, 1968). If self-asserting is performed on the floor, the male *runs* around with clumsy steps; if on a branch or other perch, he makes several turns, showing himself off alternately from the front and the back to his opponents (males), which keep their distance. The courtship display is almost the same except that it is accompanied by a courtship song typically mingled with "tock-tock's" and mimicry. If the male performs on the floor, he again *runs* around the female.

ACKNOWLEDGEMENTS

The present paper is the third in a series of studies on Madagascar thrushes (for the first two, see Farkas 1971, 1972), a project which has been fully and most generously supported by a grant from the Frank M. Chapman Memorial Fund of the American Museum of Natural History. During the visits to Mt. d'Ambre, the Ankaratra Mountains and Périnet I enjoyed the assistance and hospitality of the Department des Eaux et Forêts of the Government of the Malagasy Republic and of the O.R.S.T.O.M., Tananarive. Father Otto Appert, C. W. Benson (particularly), Professor J. Berlioz and G. S. Keith kindly provided me with valuable information while preparing the manuscript. I am most grateful for all their support.

SUMMARY

The status of the polytypic *Monticola sharpei* is reviewed, and a diagnosis given of its lowland race. In support, details of morphology, distribution and habitat preference are compared for the three subspecies so far known. The possibility of the existence of a fourth one is also mentioned. While in plumage, breeding season, habitat preference, primary song, nest and choice of site thereof, and timing of moult, there are certain divergences between the subspecies, as regards eggs and clutch-size, incubation, care of offspring, fixed action patterns, and calls and rehearsed songs, there seem to be no marked differences.

References:

- Farkas, T. 1962. Zur biologie und ethologie der südafrikanischen arten der gattung *Monticola* (Boie). II. Teil: *Monticola rupestris* L. *Die Vogelwelt* 83: 161-173.
- 1968. Zur biologie und ethologie der Angola-Waldmerle, *Monticola angolensis* Sousa. *Rev. Zool. Bot. Afr.* 77: 162-189.
- 1971. *Monticola bensoni*, a new species from south-western Madagascar. *Ostrich*, suppl. 9: 83-90.
- 1972. *Copsychus albospectularis winterbottomi*, a new subspecies from the south-east of Madagascar. *Ostrich* 43: 228-230.
- Goodwin, D. 1956. Note on the genus *Pseudocopsychus* Sharpe. *Bull. Brit. Orn. Cl.* 76: 143-144.
- Gray, G. R. 1871. On a new species of *Caprimulgus*. *Ann. Mag. Nat. Hist.* (4)8: 428-429.
- Greenewalt, C. H. 1968. *Bird song: acoustics and physiology*. Washington, D. C.: Smiths. Inst.
- Hall, B. P. & Moreau, R. E. 1970. *An atlas of speciation in African passerine birds*. London: Brit. Mus. (Nat. Hist.)
- Hartlaub, G. 1860. Systematische uebersicht der vögel Madagascars. II. *Journ. Ornith.* 8: 81-112.
- Lister, M. D. 1953. Secondary song of some Indian birds. *Journ. Bombay Nat. Hist. Soc.* 52: 1-40.
- Milne-Edwards, A. & Grandidier, A. 1879. *Histoire physique, naturelle et politique de Madagascar*. 12. Paris: Imprimerie Nationale.
- Neifeldt, I. 1966. The wood "Rock-thrushes". *Biol. Ptici Trudi Zool. Inst. Nauk. Leningrad* 39: 120-184.
- Rand, A. L. 1936. The distribution and habits of Madagascar birds. *Bull. Amer. Mus. Nat. Hist.* 72(5): 143-499.
- Ripley, S. D. 1964. Family Muscicapidae: Subfamily Turdinae, Thrushes. In *Check-list of birds of the world*. 10: 13-272. Cambridge, Mass.: Mus. Comp. Zool.
- Salomonsen, F. 1934. On a hitherto unknown fauna of montane birds in central Madagascar. *Nov. Zool.* 39: 207-215.
- Sharpe, R. B. 1871. Contributions to the ornithology of Madagascar. II. *Proc. Zool. Soc. Lond.* 313-320.
- Warren, R. L. M. & Harrison, C. J. O. 1971. *Type-specimens of birds in the British Museum (Natural History)*. 2. London: Brit. Mus. (Nat. Hist.)

The natal pterylosis of the Swallow-tanager

by Charles T. Collins

Received 3rd July, 1973

The natal pterylosis of passerine birds has received some attention in North America (Wetherbee 1957, 1958) and more recently in South Africa (Markus 1971). However, such information is nearly lacking for the vast assemblage of Neotropical birds, other than unquantified field observations included in various life history studies and brief quantified observations made on two species of tanagers (Collins 1963). Data are particularly lacking for species, as the Swallow-tanager *Tersina viridis*, which make up some of the smaller and distinctive taxa inhabiting this region. Until recently this distinctive fruit eating Neotropical species has been placed in the monotypic family Tersinidae. More recently (Storer 1970) it, and the tanagers of the closely related family Thraupidae, have been relegated to subfamilial status within the more inclusive family Emberizidae. However, Sibley (1970, 1973) considered *Tersina* to be only a distinctive genus in the tribe Thraupini and probably most closely related to *Thraupis* and *Tangara*.

The information presented here on the natal pterylosis of *Tersina viridis* was obtained principally from eight preserved specimens of young birds. All were collected by me in the vicinity of the Estacion Biologica de Rancho Grande, Est. Aragua, Venezuela during the spring of 1972, and are referable